

What is claimed is:

1. A circuit emulation system comprising:  
a sender-side transmitter, disposed at the  
input side of an ATM network, for receiving a  
5 synchronous-network-standards frame in conformity  
with synchronous network standards, such as SDH,  
which frame has three regions respectively assigned  
to a section overhead, an administrative unit  
pointer, and a payload; and  
10 a receiver-side transmitter, disposed at the  
output side of the ATM network, for outputting the  
synchronous-network-standards frame;  
said sender-side transmitter including  
a section-overhead terminator for  
15 terminating said section overhead of the  
received synchronous-network-standards frame,  
and  
means for converting data in all of the  
three regions of the received  
20 synchronous-network-standards frame except  
said section overhead, which regions include  
said administrative unit pointer, into ATM  
cells as object data for circuit emulation by  
ATM and sending said ATM cells out to the ATM  
25 network; and  
said receiver-side transmitter including

an ATM-cell receiver for receiving said ATM cells from the ATM network and extracting said object data for circuit emulation from the received ATM cells, and

5 a synchronous-network-standards-frame regenerator for restoring the data in the remaining regions of the received synchronous-network-standards frame from said object data for circuit emulation, which object data has been extracted by said ATM-cell receiver, and regenerating an output synchronous-network-standards frame with a new section overhead added thereto.

2. A circuit emulation system according to claim 1, wherein:

said data converting means of said sender-side transmitter includes a particular-position-information adding section for adding, to said ATM cells, particular-position information indicating particular data in said object data for circuit emulation, which particular data is located at a particular position of the received synchronous-network-standards frame;

at said receiver-side transmitter

25 said ATM-cell receiver includes a particular-position-information extracting

section for extracting said particular-position information from the received ATM cells, and

said synchronous-network-standards-frame regenerator performs restoration of said particular data in said remaining regions and addition of said new section overhead in such a manner that said particular data, which is indicated by said particular-position information extracted by said particular-position-information extracting section, is located at the same position as said particular position in the received synchronous-network-standards frame.

3. A circuit emulation system according to claim 2, wherein:

said particular-position-information adding section of said data converting means serves as a boundary-indication-pointer adding section for adding said particular-position information to a boundary-indication-pointer field of structured data, which is defined as ATM cells of ATM adaptation layer type 1 ; and

said particular-position-information extracting section of said ATM-cell receiver serves as a boundary-indication-pointer extracting section for extracting said particular-position information from said boundary-indication-pointer

field.

4. A circuit emulation system according to claim 2 or 3, wherein said particular position represents a leading position of said payload of the received synchronous-network-standards frame.

5. A circuit emulation method comprising the steps of:

terminating a section overhead of a synchronous-network-standards frame in conformity with synchronous network standards, such as SDH, which frame has three regions respectively assigned to said section overhead, an administrative unit pointer, and a payload;

converting data in all of the three regions of the synchronous-network-standards frame except said section overhead, which regions include said administrative unit pointer, into ATM cells as object data for circuit emulation by ATM, and sending said ATM cells out to an ATM network;

receiving said ATM cells from the ATM network and extracting said object data for circuit emulation from the received ATM cells; and

restoring the data in the remaining regions of the synchronous-network-standards frame from said object data for circuit emulation, which object

data has been extracted in said ATM-cell receiving step, and regenerating an output synchronous-network-standards frame with a new section overhead added thereto.

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5           6. A sender-side transmitter for a circuit emulation system in which said sender-side transmitter is disposed at the input side of an ATM network for receiving a synchronous-network-standards frame in conformity with synchronous network standards, such as SDH, which frame has three regions respectively assigned to a section overhead, an administrative unit pointer, and a payload, said sender-side transmitter comprising:

10           a section-overhead terminator for terminating said section overhead of the received synchronous-network-standards frame; and

15           means for converting data in all of the three regions of synchronous-network-standards frame except said section overhead, which regions include said administrative unit pointer, into ATM cells as object data for circuit emulation by ATM and sending said ATM cells out to the ATM network.

20           7. A sender-side transmitter according to claim 6, wherein said data converting means includes

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a particular-position-information adding section  
for adding, to said ATM cells, particular-position  
information indicating particular data in said  
object data for circuit emulation, which particular  
5 data is located at a particular position of the  
received synchronous-network-standards frame.

8. A sender-side transmitter according to  
claim 7, wherein said  
particular-position-information adding section  
10 serves as a boundary-indication-pointer adding  
section for adding said particular-position  
information to a boundary-indication-pointer field  
of structured data, which is defined as ATM cells  
of ATM adaptation layer type 1.

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15 9. A sender-side transmitter according to  
claim 7 or 8, wherein said particular position  
represents a leading position of said payload of  
the received synchronous-network-standards frame.

10. A receiver-side transmitter for a circuit  
20 emulation system in which said receiver-side  
transmitter is adapted to be disposed at the output  
side of an ATM network for outputting a  
synchronous-network-standards frame in conformity  
with synchronous network standards, such as SDH,

which frame has three regions respectively assigned  
to a section overhead, an administrative unit  
pointer, and a payload, the system including at a  
sender-side transmitter having means for converting  
5 data in all of the three regions of the  
synchronous-network-standards frame except the  
section overhead, which regions include said  
administrative unit pointer, into ATM cells as  
object data for circuit emulation by ATM and sending  
10 the ATM cells out to the ATM network, said  
receiver-side transmitter comprising:

an ATM-cell receiver for receiving said ATM  
cells from the ATM network and extracting said object  
data for circuit emulation from the received ATM  
15 cells; and

an synchronous-network-standards-frame  
regenerator for restoring the data in the remaining  
regions of the synchronous-network-standards frame  
from said object data for circuit emulation, which  
20 object data has been extracted by said ATM-cell  
receiver, and regenerating the received  
synchronous-network-standards frame with a new  
section overhead added thereto.

11. A receiver-side transmitter for a circuit  
25 emulation system according to claim 10, wherein:  
if particular-position information indicating

particular data of said object data for circuit emulation, which particular data is located at a particular position in the synchronous-standards frame, is added to said ATM cells at the sender-side  
5 transmitter;

said ATM-cell receiver includes a particular-position-information extracting section for extracting said particular-position information from the received ATM cells; and  
10 said synchronous-network-standards-frame regenerator performs restoration of said particular data in the remaining regions of the synchronous-network-standards frame and addition of said new section overhead in such a manner that  
15 said particular data, which is indicated by said particular-position information extracted by said particular-position-information extracting section, is located at the same position as said particular position in the  
20 synchronous-network-standards frame.

12. A receiver-side transmitter for a circuit emulation system according to claim 11, wherein, if said particular-position information is added to a boundary-indication-pointer field of  
25 structured data, which is defined as ATM cells of ATM adaptation layer type 1, said



particular-position-information extracting  
section serves as a boundary-indication-pointer  
extracting section for extracting said  
particular-position information from said  
5 boundary-indication-pointer field.

13. A receiver-side transmitter for a circuit  
emulation system according claim 11 or 12, wherein  
said particular position represents a leading  
position of said payload of the received  
10 synchronous-network-standards frame.

14. A circuit emulation system comprising:  
a sender-side transmitter, disposed at the  
input side of a non-SDH-transmission communication  
network, for receiving a  
15 synchronous-network-standards frame in conformity  
with synchronous network standards, such as SDH,  
which frame has three regions respectively assigned  
to a section overhead, an administrative unit  
pointer, and a payload; and

20 a receiver-side transmitter, disposed at the  
output side of the non-SDH-transmission  
communication network, for outputting the  
synchronous-network-standards frame;

said sender-side transmitter including a frame  
25 converter for converting data in all of the three

regions of the synchronous-network-standards frame  
except said section overhead, which regions include  
said administrative unit pointer, into a signal  
format for the non-SDH-transmission communication  
5 network as object data for circuit emulation by the  
non-SDH-transmission communication network, and  
sending the resulting signal-format data out to the  
non-SDH-transmission communication network;

10 said receiver-side transmitter including a  
synchronous-network-standards-frame regenerator  
for receiving said object data for circuit emulation,  
which object data has been received from the  
non-SDH-transmission communication network in said  
signal format, and regenerating an output  
15 synchronous-network-standards frame with a new  
section overhead added thereto.

15. A circuit emulation method comprising:  
converting data in all of three regions of a  
synchronous-network-standards frame in conformity  
20 with synchronous network standards, such as SDH,  
which frame has three regions respectively assigned  
to a section overhead, an administrative unit  
pointer, and a payload, except said section overhead,  
which regions include said administrative unit  
25 pointer, into data in a signal format for a  
non-SDH-transmission communication network as

object data for circuit emulation by the  
non-SDH-transmission communication network, and  
sending the signal-format data out to the  
non-SDH-transmission communication network; and

- 5        receiving said object data for circuit  
emulation from the non-SDH/SONET-transmission  
communication network, restoring the data in the  
remaining regions of the  
synchronous-network-standards frame from the  
10    received object data for circuit emulation, and  
regenerating an output  
synchronous-network-standards frame with a new  
section overhead added thereto.

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